DESIGN AND FABRICATE WELDING MACHINE CART

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Report submitted in partial fulfillment of the requirements for the award of the Diploma of Mechanical Engineering

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DECEMBER 2012

ABSTRACT

Designing and fabricating a welding machine cart for the welders is a product that fulfills the welder's needs. This project uses many materials such as mild steel, galvanized iron, stainless steel and others. Overall, this project involves many processes, starting from the design concept, fabrication and assembling procedures. Even though there are many types of welding machine cart in the market, the completion of this new model provides a more practical usage.

ABSTRAK

Mereka bentuk dan menghasilkan troli mesin kimpalan untuk pengimpal merupakan salah satu produk untuk kepentingan pengimpal. Projek ini menggunakan pelbagai jenis bahan seperti keluli lembut, besi galvanic, keluli tahan karat dan sebagainya. Keseluruhan projek ini melibatkan berbagai proses bemrula dengan idea konsep reka bentuk, pemotongan bahan, mereka bentuk dan fabrikasi. Walaupun troli mesin kimpalan seperti ini telah banyak di pasaran, namun kelaininan dalam penghasilan troli ini telah dilakukan bagi memastikan ianya lebih praktikal untuk digunakan.

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LIST OF SYMBOLS

Mm	millimeter

LIST OF ABBREVATIONS

UWC1	Universal Welding Cart 1
TTWC	Three Tier Welding Cart
UWC2	Universal Welding Cart 2

CHAPTER 1

INTRODUCTION

For this chapter, it is about discussion of the project background, problem statement, objective of the project, and lastly scope of the project.

1.1 PROJECT SYNOPSIS

In this project, the development of a welding machine cart so that the welding machine can be moved from one place to another. The design of the welding cart is more focus on placing the welding machine and the gas cylinder plus providing mobility ability to the cart.

1.2 PROJECT BACKGROUND

This project is to understand the fundamental of designing and fabricating a gas base welding machine cart for the use of welders in welding process by adding a mobility capability to the machine.

The cart has three major compartments which are two for the place of the welding machine and the other one is for gas tank compartment. The cart will also has place for the wire to be hanged so that it does not look muddled which will make things easier for the welders during the process or moving it to another place.

The welding cart is to be able to support the weight of the welding machine**.** This project is to design a perfectly match the size of the welding machine and the gas tank. The design of this project is generate the concept generation process continued with finalizing the design. After the final design is decided then the fabrication is done as the material selection is decided with the supervisor.

The idea of the project is based from problem statement and focusing on the scope that is needed for the improvement of the cart.

1.3 PROBLEM STATEMENT

A Welder frequently found himself in hard position in the welding process caused by the immobility of the welding machine and the equipment for the welding process. The problem with the tools is that they are not arranged in perfectly order and they often be found in many places in the workshop which is messy plus causing a delay in the fabrication process.

1.4 OBJECTIVE OF THE PROJECT

To developed and fabricate a welding equipment cart for mobility of the welding equipment and safety gear and also additional tool required during a welding process.

1.5 THE SCOPE OF THE PROJECT

The welding cart is more focused on Gas base welding machine with a gas tank as one of its component and its equipment which are many and not in appropriate order in the workshop or workplace.

1.6 PROJECT PLANNING

The first thing to in this project, a meeting with supervisor in the first week is done to fare the schedule of weekly meetings. The purpose is to update the supervisor on the progress of the project and guided by the supervisor to solve difficulty.

Briefing based on the introduction and next task of the project is given by supervisor. Make research of literature review with the means of

the internet, books, available published articles and materials that is related to the title.

The designing phase starts by sketching three models of the welding cart using manual sketch on A4 papers. Do the comparison between three and come out with the best concept design. The fourth design is drawn in software applications which helps to draw a better dimension downloaded from internet which is Software Solid Work.

Next is the preparation of mid-presentation of the project. Before presenting, the supervisor will see through the slide presentations and comment on corrections to be made. Then, presentation on the knowledge attained and instilled in the design phase is presented to a panel of three judges.

Following up, is the fabrication of make some method for this project. The material is decided plus with a list of the material and dimension. The planning of fabrication process for the project is done.

After that, the fabrication process is proceed. It would take seven weeks to get this design and fabrication process alteration done. A few analysis and testing of the welding cart are done plus the correction of the error. Finish the fabrication process with painting process.

After that, the final report writing and final presentation will be the last task to be accomplished. The supervisor will review the final presentation and revise mistakes to be amended. The final presentation then again will be presented to three panels. A draft report would then be submitted to the supervisor to be point out the flaws. Corrections are done and the real final report is handed over as a completion of the final year project.

1.7 GANTT CHART

Based from the Gantt chart on table 1.7, the project starts with the title distribution and briefing with the supervisor which actually happened in week two due to some technical issues with the place timing of the meeting.

Week 2, proceed with the literature review for information collecting followed by methodology in week 3. Then concept generation, deciding the final concept, initial presentation and final presentation that succeedly met on respective week.

The fabrication process finished three weeks late than planned due to not enough tool and material causing the functioning test to be done two weeks late. Then project is continued with the report writing after the project is proved functioning. Finally the final presentation to show the complete work done for this project.

Table 1.7: Gantt chart

TASK	WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Title/Briefing by Supervisor	Planning														
	actual														
Literature Review	Planning														
	actual														
Methodology	Planning														
	actual														
Concept generation	Planning														
	actual														
Final Concept	Planning														
	actual														
Initial presentation	Planning														
	actual														
Material Selection	Planning														
	actual														
Fabrication	Planning														
	actual														
Functioning Test	Planning														
	actual														
Report Project	Planning														
	actual														
Final Presentation	Planning														
	actual														

1.8 CHAPTER CONCLUSION.

Every project needs objectives; scope, problem statement and also planning so that the project can be proceed successfully. Therefore, these criteria are successfully determined and the next step of the project can be proceed.

1.9 THESIS ORGANIZATION.

Chapter 1 provides the necessary intro to start a project. A project needs to have its own simple synopsis to provide a clear introduction to the project. The back ground of the project also covered as

it plays an important role knowing the more about the project. This chapter also provides the necessary objective as to set it as the target on what this project will consume to. A problem statement also mentioned as it will determine that this project is developed to solve problems that commonly occur to the target people. Scopes are given to make it more specific. Finally the planning of the project, a project is needed to be planned so that it can be done accordingly as following the planned. A Gantt chart to planned the duration of the project so that the time limit of the project can be set.

Chapter 2 is about collecting information to be used for the project. The information is collected by many references such as internet, magazines, new paper and many other source of information. This chapter mostly based on the easiest source of information which is the internet. The information regarding this project is collected from either previous project or the product available on the market as this project is based on the products that are available in the market. Then the information is then be view as to generate new ideas for the production a new product which can be practically used based on the market.

Chapter 3 is about producing new ideas for the fabrication of a new product so that it can be used. Flow chart is constructed to get a clear view on the flow of this project. Three ideas are to be generated and the ideas generated mostly based on the information that has been collected during the chapter 2. Then, evaluation is made to determine between the three ideas to choose the best design for the fabrication. Several traits or characteristic is made up and the by evaluating between the three design, the ideas which meets all the traits is considered as the most ideal design for the fabrication.

Chapter 4 provides the information on the fabrication process which has been used for producing the new product which the design is decided during the chapter 3. This chapter will show the phase of the fabrications and the processes that will be going through to produce the product. This chapter also tells about the material selection where the dimension is shown to list down the types of materials that has been used for the project. Finally, this chapter will show the finished product as to state that the fabrication process is finished.

Chapter 5 tells about the discussion made up to view the problems occur during the production of this project. The problem encounter will act as the reference for the next project. This chapter also provides the discussion about the functioning of the product that has been produce to get how the product works and prove that the product is functioning.

Chapter 6 is about the conclusion that can be made through out this entire project. The conclusion covers on what have been learn through this product or project. Recommendation also provided so that any new idea will have the reference thus problems can be avoided.

CHAPTER 2

LITERATURE REVIEW

The title development of welding machine cart requires an amount of good understanding on the knowledge of the science. Therefore, executing a research is necessary to obtain all the information available and related to the topic. The information or literature reviews obtained are essentially valuable to assist in the construction and specification of this final year project. With this grounds established, the project can proceed with guidance and assertiveness in achieving the target mark.

2.1 TERMINOLOGY

Welding is a materials joining process meaning two or more parts are coalesced at their contacting surfaces by suitable application of heat and or pressure. Welding provide permanent joint and the joint strength is typically as high as strength as base metals.

The major disadvantage of welding is that it usually performed manually so the cost for labor is high. Welding machine comes with a big size which makes it impossible to do the welding with bringing the work piece closer to the welding machine to do the welding process. The implication is the immobility of the welding machine will slow down the welding process.

Therefore, to overcome this disadvantage, welding machine cart is created so that the laboring will become easier and reduced. This is because the welding cart will make things easier for the welders to do the

welding even though it involves various place and distance as the welding machine is equipped with mobility ability.

2.2 TYPES OF WELDING MACHINE CART.

2.2.1 UWC1 – UNIVERSAL WELDING CART

FIGURE 2.1: UWC1 – UNIVERSAL WELDING CART 1.

SOURCE: ranger-forums.com

The UWC1 is designed to make the maneuvering your welder easy. It has 50kg of capacity. It comes with an overall dimension of 81 cm × 41 cm × 50 cm. The shipping weight of the product is 11.33 kg. This product is steel construction with power coat finish.

The advantages of this product are the single gas tank rack is capable of holding up to a 19.05 cm diameter, 36.29 kg cylinder and comes with a securement chain to hold the gas tank in place. The slanted top shelf accommodates most brands of welding equipment and places the welder controls at an easy to use angle.

The disadvantage of this product is that it can only hold a small gas tank causing a limited time of used the welding machine. This also can cost a lot of money for changing the gas tank. These carts also do not have a handle causing a slight of difficulty for maneuvering to a big distance.

2.2.2 TTWC – THREE – TIER WELDING CART

FIGURE 2.2: TTWC – THREE – TIER WELDING CART

SOURCE: hobartwelders.com

The Three – tier welding cart comes with 50 kg capacity with an overall dimension of 69.85 cm × 41.18 cm × 73.025 cm. It has a shipping weight of 14.06 kg. These welding machines cart also a steel construction with power coat finish.

The advantages of this welding machine cart are welders control is put at a comfortable working height and has storage shelves for all your tools and accessories. The gas tank rack is capable of holding up to a 16.51cm diameter cylinder and comes with two securement chains to hold the cylinder in place. The slanted top shelf accommodates most brands of welding equipment and places the welder controls at an easy to use angle.

The disadvantages of this welding machine cart are it does not have handle for the welder to hold and make it easier for the maneuvering of the welding cart. This condition can put the welder a dangerous situation where the welding machine might fall during the maneuvering of the cart.

2.2.3 UWC2 – UNIVERSAL WELDING CART 2.

FIGURE 2.3: UWC2 – UNIVERSAL WELDING CART 2

SOURCE: weldingweb.com

The UWC2 is a welding machine cart for welding process that comes with 50kg capacity and an overall dimension of 82.04 cm × 46.48 cm × 75.44 cm. This welding machine cart also has a shipping weight of 14.51kg plus it is a steel construction with coat finish.

The advantages of the welding machine cart are the single cylinder gas tank rack is capable of holding up to a 19.05 cm diameter, 36.29 kg cylinder and comes with a securement chain to hold the cylinder gas tank in place. The slanted top shelf accommodates most brands of welding equipment and places the welder control at an easy to use angle. This cart comes with a new fold handle. The used of the handle is to easily move

your welding equipment in to place the fold down the handle for the easy access to welder controls. The wrap around cable holders help keep your cables organized.

The disadvantage of this welding machine cart is that only small size cylinder can be place on the cart even though the amount is two. The cart is not stable and might fall it is moved.

2.3 CHAPTER CONCLUSION.

The conclusion for this chapter is that all the information plans for continuing this project has been collected and it is found that the information that has been collected play an important role and will highly contribute to the process in the chapter two which will be the phase of producing a different product from the current one thus the will project will running smoothly.

CHAPTER 3

METHODOLOGY

In designing and fabricating the welding machine cart, a flow of methods was needed to be used for the designing. First of all, a process planning had to be charted out. This will act as a guideline to be followed accordingly so that, the final model sees the requirement and time could be fared. This would determine the efficiency of the project to be done. Regulating and analyzing these steps are very important as each of the steps has its own criteria to be followed.

3.1 FLOW CHART

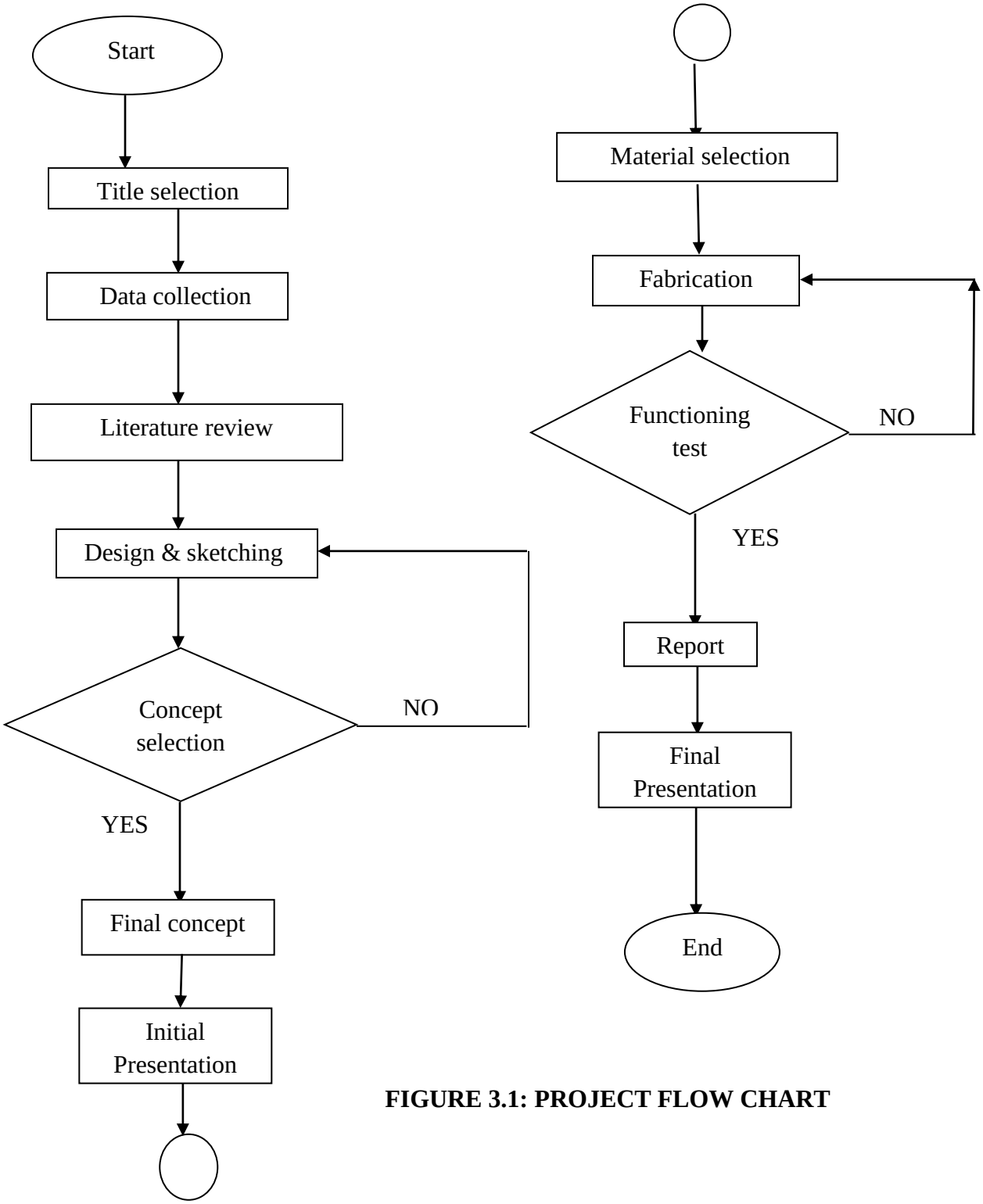

FIGURE 3.1: PROJECT FLOW CHART